

On page 1 line 11, replace "to the phase transition type of the hot" with "to the hot".

On page 1 line 18, change the spelling of "dectectable" to "detectable".

On page 1 line 21, replace "N 5 nematic liquid" with "N5 nematic liquid".

On page 1 line 21, replace "to detect a hot spots." with "to detect hot spots.".

On page 1 line 23, replace "temperature of 0.1degree centigrade" with "temperature of 0.1 degree celsius".

On page 1 line 27, replace "degree Centigrade" with "degree Celsius".

On page 1 line 28, replace "degree Centigrade" with "degree Celsius".

On page 1 line 28, replace "liquid crystal transition" with "liquid crystal phase transition".

On page 2 line 3, replace "the amount" with "the lowest amount".

On page 2 line 4, replace "requires" with "required".

On page 2 line 5, change the spelling of "dfference" to "difference".

On page 2 line 10, replace "method is that" with "method was that".

On page 2 line 12, replace "temperature." with "temperature, thus most  
a1 low power hot spots cannot be detected.".

On page 2 line 12, replace "mode heating is" with "heating mode was".

On page 2 line 19, change the spelling of "sensistivity" to "sensitivity".

On page 2 line 21, replace "The invention use a varying temperature control method" with "This invention invented an infinitesimal temperature control method".

On page 2 line 23, replace "close to" with "close below to".

On page 2 line 24, replace "a hot spot with one" with "a low power hot spot with only one".

On page 2 line 25, after "routinely detected." insert "The infinitesimal temperature control method can be achieved by many forms of heating means, such as, but not limited to, a conductive hot plate, a convective oven or a radiative heating light. All these heating means work with various degrees of effectiveness in the invented infinitesimal temperature control method. The key to the said infinitesimal temperature control method is that the heating means operates in a repeatedly turning on and turning off mode. It is during the turning on mode that the heating means will gradually heat up the liquid crystal film and will bring the film temperature infinitesimally close below to the liquid crystal phase transition temperature. To illustrate the said infinitesimal temperature control method, a detailed radiative heating light heating system is described in the SUMMARY OF THE INVENTION and the DETAILED DESCRIPTION OF THE INVENTION.

It should be emphasized that it is not the detailed design of the heating means that contributes to the primary success of bringing the liquid crystal film temperature infinitesimally close below to the liquid crystal phase transition temperature, rather it is the invented method of operating the heating means at a repeatedly turning on and turning off mode."

a 4 On page 2, line 26, after "pulsing input to the hot spot." insert "The pulsing input induces a voltage induced blinking which can be mistaken for the hot spot induced blinking."

a 5 On page 3 line 1, replace "the invented varying temperature control method." with "a differentiation method invented by this invention, that is, by observing the temperature responses of these two kinds of blinkings: the hot spot induced blinking increases in blinking spot size as the liquid crystal temperature rises, the voltage induced blinking remains in blinking spot size as the liquid crystal temperature rises."

On page 3 line 13, replace "no.9, sept. 1968" with "No. 9, Sept. 1968".

On page 3 line 16, replace "June 1977,Pg. 51-55." with "June 1977, Pg. 51-55."

In the SUMMARY OF THE INVENTION:

On page 3 line 18, replace "Both the collimating" with "This invention invented a few processes that significantly improve the effectiveness of the liquid crystal hot spot detection method in terms of the ability to detect the lowest power hot spot on a die or wafer. These invented processes, new use of certain liquid crystals, and hardware include, but are not limited to, the following items:

- a 6  
contd
- Item (1): The new use of a few nematic liquid crystals for the liquid crystal hot spot detection method;
  - Item (2): A new process to judge and obtain an optimal thickness of nematic liquid crystal film that is most suitable for the liquid crystal hot spot detection method;

Item (3): A new process to differentiate the voltage induced blinking from the hot spot induced blinking when current input to the die or wafer is operated at a pulsing mode. The hot spot induced blinking site is where the hot spot is located;

Item (4): A new process to operate the heating device that means to control the temperature of the liquid crystal film. The process consists of repeatedly turning on and turning off the heating device. The process results in the temperature of the liquid crystal repeatedly rising above and dropping below the liquid crystal phase transition temperature. During the temperature rising and dropping process, the temperature of the liquid crystal film is brought infinitesimally close below to the liquid crystal phase transition temperature for a limited length of time window. It is during this limited length of time window that the low power hot spot is detectable.

Item (5): A radiative heating system hardware to represent the heating device discussed in item (4).

To make it easy for the reader to follow, I have chosen the radiative heating system discussed in Item (5) to illustrate how the heating device works and how all the invented processes are related to each other. However, this does not mean that the radiative heating system is the only heating device that will work well for this invention. This invention refers to the heating device as either a conductive heating device, a convective heating device, or a radiative heating device.

For the radiative heating system, both the collimating".

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On page 3 line 20, replace "formation an even temperature" with "formation of an even temperature".

On page 4 line 3, replace "temperature rising" with "temperature rises".

On page 4 line 5, change the spelling of "arbitrary" to "arbitrarily".

On page 4 line 8, replace "circuit in the" with "circuit to the".

On page 4 line 12, change the spelling of "arbitrary" to "arbitrarily".

On page 4 line 16, replace "degree centigrades for" with "degree Celsius

A1 just below the liquid crystal phase transition temperature, for".

A4 On page 4 line 17, replace "how close this invention can" with "to how close this invented infinitesimal temperature control method can".

On page 4 line 22, replace "temperature the liquid" with "temperature of the liquid".

On page 4 line 27, change the spelling of "crystal" to "crystals".

On page 5 line 2, replace "transition temperatures," with "transition temperatures;".

On page 5 line 3, change the spelling of "transitions" to "transition".

On page 5 line 3, replace "be the order of" with "be on the order of".

On page 5 line 4, replace "centigrades" with "Celsius".

On page 5 line 5, replace "centigrades" with "Celsius".

On page 5 line 8, change the spelling of "work" to "works".

On page 5 line 9, change the spelling of "elctrical" to "electrical".

On page 5 line 18, replace "The process" with "The invented process of".

On page 5 line 20, after "voltage induced blinking." insert "In this SUMMARY OF THE INVENTION and the DETAILED DESCRIPTION OF THE INVENTION, I have only described the radiative heating system as the means to control the liquid crystal temperature to infinitesimally close below to the liquid crystal phase transition temperature. It should be understood that other forms of heating designs, such as a conductive hot chuck or a convective heat oven, as long as they are repeatedly operated in a turning on and turning off mode, are also capable of controlling the liquid crystal temperature to infinitesimally close below to the liquid crystal phase transition temperature. Therefore, the invented infinitesimal temperature control method can be applied to other forms of heating means that operate at a repeatedly turning on and off mode; this invention is not just limited to the described radiative heating system. Although we chose the nominal electrical input power as 1.2 Hz and at 50% duty cycle, it should be understood that the choice of other frequency and duty cycles will also yield similar results. Therefore, this invention also is able to operate at other than 1.2 Hz and other than 50% duty cycle."

In the BRIEF DESCRIPTION OF THE DRAWING:

As per your instructions, Figures 1 and 2 are redrawn with permanent ink. The blurry lines are also redrawn with clear lines. No new information is added in the redrawn Figures 1 and 2. However, <sup>some of</sup> the alphanumeric characters that are used for item identification are simplified; they are replaced by only numerical numbers.

On page 5 line 23, replace "the liquid crystal layer" with "liquid crystal film".

In the DETAILED DESCRIPTION OF THE INVENTION:

On page 5 line 26, replace "The signal frequency 1" with "The frequency of signal 1".

On page 6 line 1, replace "close to human heart" with "close to the human heart".

On page 6 line 2, replace "beat rate, therefore" with "beat rate; therefore".

On page 6 line 2, change the spelling of "human" to "humans".

On page 6 line 5, replace "the phase transition is possible." with "the hot spot induced blinking is visible.".

On page 6 line 7, replace "The signal frequency cannot be higher than 60 Hz, for which" with "The frequency of signal 1 is lower than 60 Hz, because"

Q10  
On page 6 line 10, replace "state switch. The switch 2" with "state switch. For illustration, this switch is a relay switch 2. The relay switch 2".

On page 6 line 14, replace "relay switch are" with "relay switch 2 is".

On page 6 line 19, replace "length each equal" with "lengths are each equal".

On page 6 line 21, replace "the phase transition, at a given signal" with "the hot spot induced blinking, at a given signal 1's".

Q12  
On page 6 line 23, replace "phase transition is slow" with "hot spot induced blinking is slow".

On page 6 line 24, replace "phase transitions during" with "hot spot induced blinking during".

*a13* On page 6 line 25, after "short time window." add "It should be noted that other "on" and "off" time length combinations will also work for this invention."

On page 7 line 2, replace "thin layer" with "thin film".

On page 7 line 3, replace "crystal layer" with "crystal film 28".

On page 7 line 11, replace "crystal thin film on" with "crystal film 28 on".

On page 7 line 13, replace "or no liquid" with "or there is no liquid".

On page 7 line 15, replace "liquid onto" with "liquid crystal onto".

*a14* On page 7 line 17, replace "liquid crystal. If the nematic liquid crystal film is" with "liquid crystal film 28. If the nematic liquid crystal film 28 is".

On page 7 line 19, replace "film is too thick. Use a" with "film 28 is too thick, use a".

On page 7 line 20, replace "When the nematic liquid crystal" with "When the nematic liquid crystal film 28".

On page 7 line 22, replace "crystal film would" with "crystal film 28 would".

On page 8 line 4, replace "because a D.C. give a steady" with "because D.C. gives a steady".

*a15* On page 8 line 16, after "objective lens." insert "The heating lights 7 and 25 are connected to power supply 5 in an identical manner. Similarly, the heating lights 24 and 26 are connected to power supply 18 in an identical manner."

On page 8 line 16, replace "to form an even and well" with "to form even and well".

On page 8 line 20, replace "each other, and the" with "each other; the".

On page 8 line 23, replace "attenuation, in which effect exists" with "attenuation; these effects exist".

On page 9 line 2, replace "24, 25, and 26." with "24, 25 and 26.".

On page 9 line 4, replace "crystal on" with "crystal film 28 on".

On page 9 line 7, replace both "layer"s with "film".

On page 9 line 8, replace "layer" with "film".

On page 9 line 9, replace "be in an optimal thickness" with "be at an optimal thickness".

On page 9 line 10, replace "crystal 28" with "crystal film 28".

On page 9 line 14, replace "centigrade" with "Celsius".

On page 9 line 15, replace "layer" with "film".

On page 9 line 18, replace "layer" with "film".

On page 9 line 20, replace "more sensitive of this" with "more sensitive is this".

On page 9 line 22, replace "35 were" with "35 was".

On page 9 line 23, replace "35 were" to "35 was".

On page 9 line 25, replace "however, further" with "However, further".

On page 10 line 2, replace "32, 36 and" with "32, 36 and".

On page 10 line 3, replace "centigrades." with "Celsius.".

On page 10 line 4, replace "Considering the all" with "Considering all".

On page 10 line 5, change the spelling of "inrtegrated" to "integrated".

On page 10 line 12, replace "were high" with "was high".

On page 10 line 13, replace "the pulsing voltage would" with "the pulsing square wave voltage 3 would".

On page 10 line 14, replace "layer 28" with "film 28".

On page 10 line 18, replace "wattage were" to "wattage was".

On page 10 line 21, replace "blinking effect." with "blinking".

On page 10 line 21, replace "the two effects." with "the two kinds of blinkings."

On page 10 line 23, replace "voltage were" to "voltage was".

On page 10 line 24, change "wattage were" to "wattage was".

On page 10 line 27, change the spelling of "transation" to "transition".

On page 10 line 28, replace "described in step S6 is" with "(described in step S6) is".

On page 11 line 2, replace "crystal layer 28" with "crystal film 28 to".

On page 11 line 5, after "enlarging blinking spot." insert "I call this

*216* blinking the 'hot spot induced blinking'.".

On page 11 line 8, replace "phase transition" with "phase transition temperature".

On page 11 line 10, replace "blinking spots." with "hot spot induced blinkings."

On page 11 line 11, replace "to show up the" with "to show the".

On page 11 line 12, replace "spot were" with "spot was".

On page 11 line 13, replace "seconds , at just" with "seconds, at just".

On page 11 line 14, replace "layer" with "film 28".

On page 11 line 17, replace "blink; Also, the nematic liquid crystal layer 28" with "blink; also, the nematic liquid crystal film 28".

On page 11 line 23, replace "layer" with "film".

On page 11 line 24, replace "repeat the step" with "repeat step".

On page 11 line 24, after "from the beginning." insert "In the BRIEF DESCRIPTION OF THE DRAWING and in this DETAILED DESCRIPTION OF THE INVENTION, I have described only a 4-heating light system which consists of heating lights 7, 24, 25, 26 and power supplies 5 and 18. It should be noted that other forms of heating means, such as only a single heating light design, or a conductive hot chuck, or a convective heat oven, can also control the liquid crystal temperature, such that the temperature of the nematic liquid crystal film 28 will exhibit a time profile as depicted in Figure 2, that is, bringing the liquid crystal film temperature infinitesimally close below to the liquid crystal phase transition temperature 22. Therefore, this invention will work with other types of heating devices, as long as the heating devices are operated with the infinitesimal temperature control method."

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